A letter on the yellow fever of the West Indies / by Daniel Osgood, M.D. practitioner of medicine in the city of Havana.

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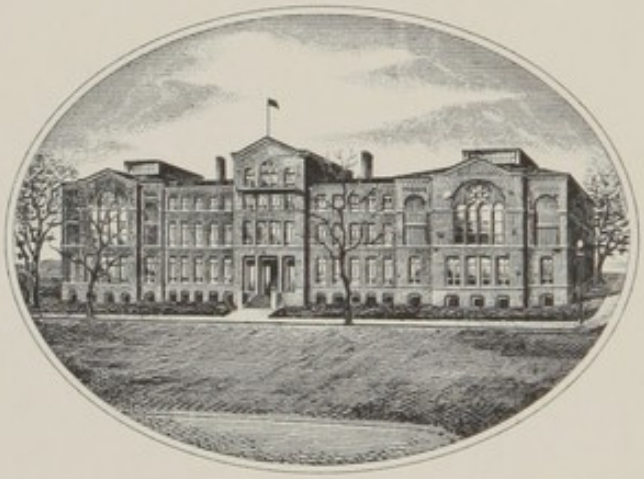

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U. S. Department of Health, Education, and Welfare

Public Health Service

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A

LETTER

ON THE

YELLOW FEVER

OF

THE WEST INDIES.

BY DANIEL OSGOOD, M. D.

FRACTITIONER OF MEDICINE IN THE CITY OF HAVANA.

"Meantime, the moist malignity to shun
Of burthen'd skies, mark where the dry champaign
Swells into cheerful hills; where marjorum
And thyme, the love of bees, perfume the air."

ARMSTRONG.

NEW-YORK:

PUBLISHED BY ELAM BLISS, 208 BROADWAY.

J. Seymour, printer.

1820.

TO

CYRUS PERKINS, M. D.

LATE PROFESSOR OF ANATOMY AND SURGERY AT DARTMOUTH COLLEGE.

DEAR SIR,

The common obligation due to those who have distinguished themselves, both as practitioners and public teachers of medicine, not less than the intimate friendship which subsisted between us many years ago, while fellow-students in medicine, induces me, instead of merely answering your several questions on the diseases of our climate, to address to you a hasty, but more formal treatise, on that with which I have been most familiar,—the Yellow Fever of the West Indies.

I do this with the more confidence, under the impression that your having now become a resident of New-York, which has occasionally been the seat of its ravages, and the reflection that you are addressed by an old friend, who has been long and intimately conversant with the subject of which he treats, are circumstances calcu-

lated to render my observations, imperfect as you may find them, in some degree acceptable.

Although, as you will perceive, I have rather avoided all controversial remarks, on the identity of the disease in different countries, and on the question whether it be from a contagious cause or not, yet I feel it my duty, so far to answer your inquiries on these points, as here to state, that, regarding its character both within the tropics, and in the higher latitudes, where I have been acquainted with it, I have not been able to discover any other varieties of its symptoms, than such as I conceived to have arisen from the differences of constitution, exposure, and treatment, in those affected by it, and from changes in the weather. Nor have I seen an instance, during nearly twenty years constant practice in this disease, in which it appeared to me to be communicated from one person to another; or of its having originated from any exposure whatever, excepting in places peculiarly circumstanced.

These circumstances of the exclusive regions of the disease, are *desiderata* which I have endeavoured to investigate; but what

I have collected on this head, I have merely advanced for consideration, without undertaking myself to decide on its conclusiveness.

In the descriptive and practical parts of what I have written, I have quoted some particulars that accord with my own experience; but have avoided, as much as possible, the repetition of what is recorded in the writings of others, not important in practice.

In explaining my ideas, however derived, I have found it convenient, in many instances, to adopt the terms employed by the late Dr. Brown, in his Elements of Medicine; though I concur with you in rejecting the notion, that the different states of the system depend on mere *quantity* of action. For the energies of the living body, and the external powers which actuate them, evidently differ in kind as well as in degree. Therefore, in contradiction to the opinions of that author, it is generally admitted, I believe, that particular substances and influences may, in a specific manner, either generate or destroy disease.

The numerous cases of yellow fever which

have fallen under my observation, in Havana, have led me to regard it as being of similar origin to the common *synocha;* for amongst a number of persons falling sick at the same time, and in the same situations, some have only the simple *ephemera* or diary fever; and very many recover before the end of the fourth day, without the appearance of any other symptoms than the common ones of *synocha.* Whereas some few of the whole number of the sick have peculiar symptoms, of a malignant nature, which attach to the disease a distinct character, and which would, perhaps, authorize our denominating it the *malignant synocha.*

You will perceive, by my communication on this disease, that I attribute its origin to local causes, independently of any effect produced on the subjects of it, by the previous existence of the same disease; in like manner as intoxication may be produced by exposure to an air impregnated, or infected, if you prefer the term, with the fumes of ardent spirits; or as a tertian fever is caused by exposure to the *miasmata* of a marsh.

Had leisure permitted me to note particular cases with sufficient accuracy, I should

have presented you with a statement of them, to exemplify my varied practice; for no other disease, with which I am acquainted, exhibits symptoms, and requires to be treated, so unlike, in its different subjects. At a future period, I may have it in my power to supply this deficiency.

Regarding your discrimination of contagious and infectious diseases as important, I take the liberty to annex to my publication an extract of the letter, with which you favoured me, on that subject.

I remain, with great esteem,

Yours, &c.

DANIEL OSGOOD.

A LETTER
ON
THE YELLOW FEVER,
&c.

SYMPTOMS.

In this disease, first a lassitude is felt, sometimes with alternate chills and flushes of heat, but at other times, with great heat and no chills. To these feelings quickly succeed, sore pains in various parts of the body, and a fiery redness of the eyes, face, neck, and breast. The pains and heat are accompanied with more or less of a moisture, on some parts only of the body, a quick and full, or, if not such, a suffocated pulse, a scanty secretion by the kidneys, some degree of costiveness, inward heat, thirstiness, anxiety, nausea, faintness, and giddiness.

The pains felt are most severe in the orbits of the eyes, in the loins, and in the bones and muscles of the limbs. In some violent cases, the patients, from the beginning, have a peculiarly wild

and desponding countenance; they also experience most distressing sensations of soreness, heat, and fulness in the epigastric and umbilical regions; retch frequently, and sometimes bring up bile, and at other times a watery phlegm only.

The disease has differences in its symptoms, which seem to depend on the varieties of constitution in its subjects. Those of a phlegmatic habit, and young people, are mostly comatose when first taken with it; if this happen not to be the case with them, they are nevertheless averse to moving, or to looking about themselves, from heaviness of the head, and the very great soreness of the muscles of the voluntary and mixed motions. The sanguineous and robust of habit are liable to be most strongly attacked. These have unceasing restlessness and watching, with a sense of stricture across the chest and the abdomen; and of these, some experience a general anguish, which they express by frequent sighing and moaning.

Persons who are of an active disposition, but a weakly constitution, are commonly affected with extreme weakness, and have for the most part a parched skin; although there are cases in which the skin is constantly damp, with very little outward, but great inward heat.

There are few cases which are not attended by an occasional propensity to vomiting; and it has

been remarked of this fever as a peculiarity, that actual vomiting produces no permanent diminution of this propensity, or of the fulness, heat, and soreness felt in the stomach.

It is also remarkable that the mouth, tongue, and fauces of a patient with this fever, are seldom parched; but a whitish, or more or less of a yellowish foulness, covers the tongue.

Its early symptoms sometimes resemble so exactly those of intoxication, that I have often known masters of vessels reprove their sailors, when attacked by it, for supposed drunkenness.

After the first violence of the symptoms has continued from one day, to two, three, four, five, or more, the pains, heat, and redness become less; and in some cases these, together with all the others, entirely disappear, leaving the patient convalescent; but in other instances a yellowness of the eyes, face, &c., and a vomiting of a black and flaky substance, which has commonly been said to resemble coffee with its grounds, are seen in the place of the previous redness of the countenance, and of the yellow or slimy vomiting with which the disease commenced.

These unfavourable changes have most frequently appeared, when the fever has been great, on the fifth day of its continuance; and often a hiccough is then an additional symptom.

If, when the flushes of the skin go off, a yellowness is not exhibited, a livid hue is sometimes seen; which appearance has given occasion to the naming of the disease the black, instead of the yellow fever, by the common people of the West Indies.

At, or near this period of the disease, the patient either dies suddenly, or new symptoms arise. In the latter case, the skin becomes again parched with heat; petechial or other spots are sometimes seen on it; an epistaxis, and other hæmorrhages oftentimes take place; the distressing nausea and anxiety continue; and the black vomit is brought up with a hoarse or hollow sound. In some instances, however, nothing is vomited; and in others, there is a vomiting, not of black matter, but of a watery substance of a slimy nature, and with it whatever the patient may have lately taken of drink or medicine. The stools, at this time, have commonly like appearances to the vomit; and often the hiccough is now, if it had not been before, a troublesome symptom.

On dissecting subjects dead of this fever, the same kind of blackish matter, as that which constitutes the black vomit, is found in the stomach; and marks of inflammation have often been perceived in that organ, and sometimes also in the liver and in the brain.

Amongst the worst symptoms that attend this

fever, throughout the whole course of it, are extreme weakness, an insupportable weight in the præcordia, an uncontrollable mobility of the stomach, a constant sensation of burning and fulness in the same, and, above all, that sense of general anguish, which is attended with, and seems to cause the desponding look, and the constant moaning above mentioned.

If, after the primary fever has disappeared, or after the secondary one, that may have arisen, has abated, the hands and feet become cold; if a transuding sweat stand on the skin; if black urine be discharged, or if the urine be scanty, or be totally suppressed; if the black and flaky vomiting continue, or if, with or without this symptom, blackish or clay-coloured or chyle-like stools appear, we may look for death at hand.

The very near approach of death is apparent from the slower and slower pulsation of the arteries, entire helplessness, a difficulty of breathing and of swallowing, dimness of sight, and convulsions.

A deep yellow colour of the skin is sometimes a favourable symptom, but oftener an unfavourable one. When this appears on the eighth or ninth day, together with any of the symptoms of returning vigour, it may be owing to an increased action of the secretory and absorbent vessels, by which

newly formed bile has been collected, and its lymphatic parts thrown into the circulations. But when a like colour appears, together with symptoms of a sinking state, as a feeble pulse, dropping of blood from the nose, suppression of the urine, transuding sweats, or burning of the skin, with colliquative stools, and an harassing hiccough, it proves the crasis of the fluids, to be already broken, and a separation of the yellow serum of the blood to have taken place, and suffused itself under the skin. The earlier this dusky hue takes the place of the previous fire-like colour of the skin, when not the consequence of copious bleeding, the greater we judge the violence of the disease to have been; and that the life of the patient is more assuredly at stake.

In severe cases, it is only when the fever moderates gradually, beginning to abate in its violence before the end of the third day, that the dangerous symptoms of yellowness, and the deadly torpor, or afterwards the symptoms of a secondary fever, do not take place.

In some less violent cases, should the fever continue, with but little or no abatement of its force, or even with a slight increase of it throughout the fourth or the fifth day of its progress, if then it begin to moderate, with a discharge of saliva, and the mucus of the mouth and fauces; and a flow of

sweat, urine, and bile, mixed with the other proper alvine secretions, the patient may be expected to keep on mending till well; or though the secondary fever may have come on, after the disappearance of the first set of symptoms, and instead of purple spots, or the beforementioned marks of a broken crasis of the fluids, with a prostration of the tone of the solids, if then suppurating phlegmon should arise, and form a well-matured pus, or without a phlegmon, if a warm moisture over the whole body, and other wholesome excretions take place, we may, from such appearances, pronounce the patient to be convalescent.

It proves the misfortune of some, in this disease, after beginning to mend, to fall ill again, and to linger with a small fever. Cases of this kind, after a continuance of many days, sometimes terminate with a fatal black vomiting.

For the most part, however, when the symptoms of returning health have appeared, the patients speedily become quite well; although the same degree of vigour which they possessed before their attack, is not, for a long time afterwards, fully restored to them.

THE SUBJECTS AND THE REGIONS FOR THE YELLOW FEVER.

The species of fever which authors have denominated *synocha*, is chiefly incident to persons of a plethoric habit and rigid fibre, in the spring, or the beginning of the warm season, but mostly confined to cold or temperate climates. The fever under consideration especially attacks persons of the like constitution, lately arrived from a cold to a hot climate, or exposed to a sudden change from a cool to a very hot season.

By a residence for some time in a warm and moist climate, the fluids of the body become so proportioned to the capacity and elasticity of the vessels containing them, as to render it unsusceptible of this fever. Yet no person, whatever his state or habit of body may be, can be considered entirely exempt from the danger of an attack, till he shall have resided one year at least within the region of the disease, or in a climate where the temperature never falls to the freezing point.

Those who arrive in such a place with a hectic, dysenteric, intermittent, remittent, or a rheumatic fever, are nevertheless often attacked with the

yellow fever; though convalescents from fever, or other acute diseases, escape with impunity.

It is to be noticed of the regions of the yellow fever, that

1st. It never originates in any place where the heat is not, for a length of time, greater than that to which the subjects for it have, a short time previously, been accustomed.

It has only been in the hot season of the year, that the disease has originated in any of the cities or towns of the United States. Frosty weather has invariably effected its destruction.

Baron Humboldt, in his History of New Spain, says: "The physicians of the United States, who adopt the opinion that the yellow fever originated in the country itself, think they discover the disease in the pests which prevailed in 1531 and 1612, among the red men of Canada and New England." "From the little we know of the Matlazuhatl of the Mexicans," he adds, "we might be inclined to believe that, in both the Americas, from the remotest period, the copper-coloured race has been subject to a disease which, in its complications, resembles, in several respects, the yellow fever of Vera Cruz and Philadelphia; but which differs essentially from it, by the facility with which it is propagated in a cold zone, where the thermometer,

during the day, remained at 10° or 12° centrigrade (50° and 53° Fahrenheit)."

In any situation, the being suddenly exposed to an unaccustomed degree of the sun's heat, might, in persons of plethoric habits, occasion an inflammatory fever. But heat of the air alone does not cause the yellow fever; for although it is only prevalent in hot weather, yet, when the season has been excessively hot, the disease has not always appeared, even in the West India ports; and in many places, where the degree of the heat of the sun is at least equal to that which is common in the West India Islands, this fever is never prevalent.

Hence it appears, that, although a certain degree of external heat is necessary to the production of the yellow fever, it is not, of itself, sufficient to cause the disease.

2d. Adjacent to all the places in which this fever becomes endemic, is the sea, or some other body of water.

In the West India Islands, with the exception of the very small ones, persons who reside in the inland parts, when affected with fever, have it not of this kind; but instances of its being of this kind are seen in them, when they have become disordered shortly after they had left the interior, and removed to the sea, or a harbour. On the contrary,

even strangers from cold climates, who, on their first arrival to a tropical one, go into the country, and remain there, escape the disease.

When, at Cadiz, a hundred persons were dying in a day of this fever, in September and October, 1764, Dr. Lind informs us that "the people in the country remained in perfect safety from it." It is important to notice also his saying, that "then the winds blew mostly from the south, and after sun-set there fell an unusual and heavy dew." (Lind on Hot Climates, part i. sect. 4.)

Dr. Rush also observes; "It has been remarked, that this fever did not spread in the country when carried there by persons who were infected, and who afterwards died with it. During four times, in which it appeared in Charleston, in no one instance, according to Dr. Lining, was it propagated in any other part of the country." (Rush's Account of the Yellow Fever of 1793.)

Even at sea, in calm weather, and within the tropics, when the heat is great, the yellow fever is occasionally seen, in persons from the more northern latitudes. This, we may here remark, happens on board of vessels, having nothing in but stone ballast, a cargo of salt, or a like incorrupt lading; so that no putrescent matters, in any unusual quantity, are invariably present, where the particular fever we speak of may arise.

Another peculiarity to be remarked of the places where this disease arises, is, that

3d. The air, in the immediate vicinity of all such places, receives little or no tempering from vegetation. Neither on the Spanish Main, or in the West India Islands, where the malady has more especially prevailed; nor in the parts of the United States, where it has also arisen, was it seen, until after a considerable progress had been made in the population of those places, and a consequent clearing of the grounds, and the covering of them with streets and buildings, instead of their former garb of foliage, had been effected; whereas, on the shores of the Mediterranean sea, the same fever, if we may regard the *causus* of the ancients to be the same, has been known from the date of the first records we possess in medicine.

It may be affirmed that the yellow fever, or the black vomit, as it is sometimes named, never yet appeared, but as a sporadic affection, either on the western side of the American Continent, with the single exception of Panama, across the narrow Isthmus of Darien, or on the western shores of Europe, excepting in the neighbourhood of the Mediterranean sea. It also appears, that on the western coast of Africa, with the exception of certain places, at the mouths of the large rivers, which run from east to west, particularly Senegal, at the

mouth of the river of that name, and Bulam, at the mouth of the Rio Grande, the continued fever mostly prevalent, as described by Dr. Lind, and by voyagers of whom I have made inquiry, is a quotidian, or a tertian, and a synocha combined; the symptoms partaking of both these fevers, and thereby differing from the yellow fever, in its genuine form.

Independently of the courses of the ordinary winds, there is, no doubt, a difference between the quality of the air on the western side of the two great continents, compared with that of the eastern, arising from the different gases, which the atmosphere receives, in its tide from east to west, with the apparent motion of the heavenly bodies. For it is to be considered, that it passes over the green surface of the widely extended land, to the boundary on the one side, and over the ocean of water, to that on the other.

CAUSES.

The proximate cause of this fever is an inflammation, more or less general; which, if mild in degree, terminates by a gradual abatement; but if malignant, the vital fluid, in greater or less part, becomes quickly gangrenous. These conditions of the body are evident, from the increased tumidity, burning heat, and redness of the skin; the unusual fulness of the pulse; the excessively loaded state and soreness of the epigastric, hypochondriac, and umbilical regions; and the very early appearance of the symptoms, either of a broken crasis of the blood, or of recovery to a state of convalescence.

The predisposing causes are an increased action and fulness of the vascular system.

The exciting causes are those which are common to other fevers: viz. exposure to sudden changes in the temperature and purity of the air; irregularity in eating, drinking, exercise, or sleep; sudden excess or suppression of any of the evacuations; the repulsion of cutaneous eruptions; insolation; the use of cold fruits, medicines, or whatever is indigestible in the diet, whilst under exhaustion from heat, or exercise; also fear, anger,

joy, or any sudden depression or elevation of the mind.

In regard to the generating or specific cause, we have seen above that not the greatest heat of the atmosphere, nor the effluvia from corrupt organized matters, although productive of fever, can generate it of the form in question. What then is there to be found capable of producing the yellow fever, which is necessarily present where it prevails?

Three requisites, for the production of this disease, have been stated in our examination of the regions for it: viz.

1. A degree of heat, above that to which the subjects for the disease are habituated.

2. Some adjacent body of still water.

3. The destitution of air which receives a tempering from living vegetables.

Firstly. It is evident that the heat to which the subjects for this fever are exposed, above that to which they are habituated, not only proves excessively stimulating to them; but it likewise diminishes the pressure of the atmosphere on their bodies; for it has been proved by M. Amontons in particular, that the pressure of the atmosphere varies with the temperature; its density becoming less, in proportion as the heat becomes increased.

Secondly. From the surface of still water, in

harbours, lakes, and rivers, during hot weather, arise oxygen and hydrogen gases, which are afforded by the decomposition of water.

Dr. Ingenhous's eudiometrical experiments prove, that the air, near to the sea-shore, and at the mouths of rivers, contains a greater proportion of oxygen, than at a considerable distance from the shore, either on the land or sea.

Dr. Dobson, of Liverpool, has also found, that sea water contains air of a purer quality than the common air of the atmosphere.

Sir Benjamin Thompson's experiments, to ascertain the effects of light and heat, in producing oxygen gas from water alone, demonstrate, that it is set at liberty by them, from all still bodies of that fluid; and most where the heat is the greatest. It is found to be thus produced, even when the heat does not exceed 65° or 70° of Fahrenheit. The same may possibly be produced by the decomposition of dew or rain, after long continued droughts have heated and parched the earth, in places near to which no extensive body of water is situated.

Thirdly. Where vegetables are growing, the atmosphere receives, from them, various *effluvia*. It is also well known, that vegetables derive a great proportion of their aliment, from the constituent principles of decomposed water; the oxygen en-

tering largely into the formation of their acids, and the hydrogen into that of their oil, resin, and wax. Therefore, the air of all vegetating districts, and that of the situations where no vegetables are produced, must greatly differ; the latter possessing, in particular, a greater proportion of oxygen and hydrogen.

Now the extraordinary heat of the air, to which the subjects for this fever are exposed, previously to their being attacked by it, produces in them an increased frequency and fulness of the pulse; and the capillary vessels, both on the external and the internal surfaces of the body, become turgid with blood. The diminished pressure of the atmosphere on the body, by suddenly relaxing the solids, occasions the fluids, at a distance from the heart and great arteries, to become somewhat stagnant. Furthermore, from an atmosphere, which, besides an unusual degree of heat and lightness, possesses a proportion of oxygen and hydrogen gases, above the measure of that in which the subjects of the disease have been accustomed to live, is introduced excessive stimulus into the system.

Hence it is, that, during the predisposition, and in the beginning of the disease, while the blood is entire, we see the skin remarkably red and tumid; and that afterwards, when, by a continuance of the disease, the blood has lost its red colour by stag-

nation, we sometimes observe the skin to be of a livid hue; or, at other times, if a suffusion of the yellow serum, which has separated itself from the blood, take place under the skin, it is tinged yellow. Internally, an oozing of some part of the altered blood into the stomach, &c., mixing with the bile and gastric, or other fluid matters, also altered by the disease, produces the black vomit, the black stools, and the black urine, so often seen in its latter stage.

In situations and under circumstances before described, as exposing to the yellow fever, the subjects experience, for a while, an increased excitement in all the organs of the body, whether animal, natural, or vital; expending the excitability equally throughout the whole system; but subsequently the stimulus of heat, &c. acting directly on the organs of the vital functions, continues to support their increased excitement, while the organs of the animal and natural functions have their excitability still wasted, without a proportionate supply of the same stimuli.

This state of the system clearly constitutes the disease, in its more moderate degree; but when the malignant form occurs, it happens from an early derangement of all the functions together, by a direct exhaustion of the general excitability,

I have found cases of this fever, which have arisen suddenly, without any apparent irregularity of its subjects, to prove the most malignant of any; yet one's danger of falling sick is doubtless greater, if soon after being exposed, by the changes of the air, he should be subjected, likewise, to any of the common exciting causes of fever. Because, whatever is capable of disturbing the regular functions of life, when a predisposition to disease exists, will occasion its particular cause to take effect; whereas, while all the ordinary actions of the body, in whatever degree, to a certain extent, are steadily supported, the power that in the former case is sufficiently forcible to form the disease, remains innoxious in the latter. Hence it is, that this, as well as other diseases, when reigning epidemically, may seem oftentimes to be produced, by any irregular influence whatever, on the body.

But, when produced in this way, diseases are often seen with symptoms of a mixed nature. I have remarked, that in the hot and calm seasons, on board of vessels, lying in the parts of harbours which have very little if any air, excepting from the sea-shore, blowing towards them, the crews are seldom attacked by any other than the genuine yellow fever; whereas, at the same time, any, amongst the crews of other vessels lying in parts of the same harbours, shut in by the borders of marshy

fields, who fall sick, have a quotidian or tertian fever; or a fever partaking of one of these, and a *synocha*. I have also noticed a *synochus*, in persons removed from jails, slave ships, and similar places, where typhus fever prevails, to cleanlier and more airy situations; although the yellow fever, or a simple *synocha* only, had previously been seen in the latter places.

Were registers of the weather and of diseases to be accurately kept, after the excellent manner of Cleghorn, in his treatise on the diseases of Minorca, we might find that the one or the other fever prevails more or less, according to the degree of heat, the direction of the wind, &c.

In the yellow fever of 1793, in Philadelphia, Dr. Rush remarks, that during the months of September, and a part of October, when it raged generally, "the register of the weather shows how little the air was agitated by winds, during that season." Consequently the country air, which, at other seasons, brings gases from vegetating surfaces, could afford none, at that time, to the section of the city atmosphere. In that city, the like deprivation of gases from the country, and at the same time an addition of those from the sea-shore, and up the Delaware, are to be indicated by a south wind. Dr. Rush moreover tells us, "the south winds have blown upon the city of Philadel-

phia, ever since 1793, more constantly than in former years." (Rush's Works, vol. 4.)

In the city of Havana, when the winds blow from the east, or the west, along the sea-coast, the yellow fever prevails more generally amongst strangers, both in the harbour and on shore, and is more genuine or unmixed in its character, than at other times; when the direction of the wind is from the open sea, on the north, or from the land, on the south.

PREVENTION.

Those who would visit, or reside in a place where this fever may arise, must shun, by all the means in their power, every exciting cause of any fever.

They must be particularly guarded against exposure to all sudden variations in the temperature and purity of the air; and abstain from every species of irregular indulgence. One's usual habits, if within the line of temperance, should be pursued, as to food, drink, sleep, exercise, &c.; for sudden changes to opposite habits are dangerous.

The exercise used should not be violent; but moderate exercise, as it promotes the regularity of all the functions, and disposes the mind to cheerfulness, is the best of all preventives. Hard labour, by hurrying the circulations, and wasting the strength, is capable, with the predisposing causes, of commencing the disease.

The necessary calls of sleep should never be disregarded. Sleep, duly regulated, may indeed be considered as a great means of supporting the animal powers, under the exhaustion produced by the augmentation of heat, &c. in the system; and with the same view, it is of great importance, that

an equanimity of temper should be maintained; and that all the exercises of the mind, no less than those of the body, should be regulated by moderation.

That the natural functions be not interrupted, no indigestible food, nor a diet which is too highly stimulating, should be indulged in.

Seamen, especially, being in the habit of using salted provisions, and ardent spirits, ought not to indulge themselves in the use of fresh meat, and fermented liquors. They should eat cooked vegetables with their salt meat, and be allowed spiritous drink, in a moderate quantity. But if they get intoxicated, they are in exceeding danger, on becoming sober again, not only of falling sick with the disease, but of losing their lives by its violence.

That a suitable state of the perspiration, and due secretion by the kidneys, may be supported, no extraordinary measure of either should be encouraged; for after the excess of these discharges, the opposite condition of them is liable to take place. The proper function of the skin may be preserved by cleanliness; for which purpose, a frequent use of tepid bathing, but not hot, or cold, is advisable. When full bathing cannot be had, the body should be washed, night and morning, with

salt-water. Tea and coffee, if not too strong, are suitable for promoting the above-mentioned secretion.

When the skin is moist, any sudden change, from a hot and confined, to a moist and bleak air, is to be guarded against; but if the skin be at any time parched with heat, the free air may be safely enjoyed.

The clothing should be light, that as little as possible of the animal heat may be confined about the body, but great care is requisite for the avoiding of cold. Persons, who habitually wear a light dress, can more easily, than those who are always cased in woollens, guard against the changes of the weather, and the transitions from the heat and dryness of the day, to the cold and dampness of the night.

Cleanliness of the clothing is also a circumstance of importance. It would be well if the covering next the skin were changed every morning and evening.

In regard to medicines, none should be taken, unless clearly indicated, for some particular purpose; for debilitating medicines, as well as cold fruits, and other innutritious substances, will tend, amongst other evils, to create more or less of a dyspepsia; of which the very fever that is dread-

ed, would be the most probable consequence. Tonic medicines are equally unsafe, from their tendency to suppress secretions, and increase heat.

For the valetudinary, greater precautions are necessary than are to be taken by the healthy. On the first decline of accustomary health, resort should be had to rest and abstinence; and if the stomach has been overloaded, warm water, or a weak chamomile infusion, but none of the strong emetic medicines, should be taken to expel its contents. Where there are bitter eructations and costiveness, however, emetic and purgative medicines should be employed.

Persons who have vomited, or purged, should, for a while afterwards, abstain from solids, whether meat or vegetables, and drink plentifully of diluents. This regimen, however, need be observed no longer than during the disturbance occasioned by the operations. Yet the return to full living should be gradual; for, of all dangers, no one is, at any time, more to be guarded against than the oppressing of the stomach, with a burden beyond its strength. In some very plethoric persons, while well, a free bleeding may be proper. Dr. Rush, in addition to his own and other authorities, in favour of the practice of bleeding, for persons exposed to be attacked by this malady, relates the following facts:

"Dr. Mitchel, in his account of the yellow fever which prevailed in Virginia in the year 1741, informs us, that it was often prevented in persons who were under the influence of its remote causes, by the loss of a few ounces of blood. It was formerly a practice, amongst the physicians of St. Domingo, to bleed whole regiments of troops as soon as they arrived from France, by which means they were preserved from the malignant fever of the island. During the short visit paid to this city, in the year 1798, by Dr. Borland, a respectable physician of the British army, he put into my hands," (continues Dr. Rush,) "the following communication: 'In the beginning of August, 1797, one hundred and nine Dutch artillery, arrived at Port-au-Prince, in the Bangalore transport. The florid appearance of the men, their cumbersome clothing, and the season of the year, seemed all unfavourable omens of the melancholy fate we presumed awaited them. It was, however, thought a favourable opportunity, by Dr. Jackson and myself, to try what could be done in warding off the fever. It was accordingly suggested to M. Conturier, the chief surgeon of the regiment, that the whole detachment should be blooded freely, and that, the morning after, a dose of physic should be administered to every man. This was implicitly complied with a day or two after; and at this moment, in which I

write, although a period of four months has elapsed, but two of the detachment have died; one of whom was in a dangerous state when he landed. A success unparalleled, during the war of St. Domingo. It is true, several have been attacked with the disease, but in those the symptoms were less violent, and readily subsided by the use of the lancet.

" ' The crew of the Bangalore, on her arrival at Port-au-Prince, consisted of twenty-eight men. With them no preventive plan was followed. In a very few weeks eight died; and at present, of the original number, four men remain.' " (Dr. Rush's Inquiry, &c.)

I avail myself of this quotation for a double purpose; the one, because it tends to prove that bleeding has been advantageously employed for new comers to the West-Indies; and the other, as it affords occasion to remark, that the exemption from the malignant form of the disease, experienced by the troops who were landed from the Bangalore, while the mortality was so great amongst the seamen on board, ought, perhaps, in part, to be attributed to the preventive effects of the land air.

In my own practice, by frequent purgative doses alone, sufficient depletion has been made, and the

disease prevented, in persons strongly predisposed to it.

Very light morning and evening meals ought to be taken, with such a course; as a cup of sago, weak tea, or coffee, with bread only, or with bread and a soft boiled egg.

Acidity is to be suspected, and is often discoverable in the stomach, which it may be important to correct; for this purpose a solution of the carbonate of potash is useful.

The medicine which has been employed with the greatest success, both for the valetudinary, and as a curative remedy, is the submuriate of quicksilver. This medicine has proved serviceable by its purgative operation, when it has removed excrementitious matters from the first passages; but other purgative medicines effect the same purposes, in no less degree than this; yet they do not so certainly prevent the disease, nor arrest the progress of it, when it has commenced.

It is, probably, by effecting an uniformity of excitement, that the submuriate of quicksilver proves so peculiarly serviceable in this fever; especially when the disease is not, as it is in its malignant form, caused by a direct exhaustion of all the functions together. On the other hand, while a proportionate excitement is preserved, by nature herself, it would be wrong to interfere with her. I

believe the disease has sometimes been occasioned by the preposterous use of the preparations of quicksilver, the neutral salts, and other relaxing articles.

For preventing this, and other malignant fevers, certain effluvia in the atmosphere, have proved effectual. Instances of such avail, are related by Dr. Rush:

"The yellow fever has never appeared within the effluvia of the sal ammoniac manufactory, nor of the tan-pits, in the suburbs of Philadelphia. The vapours, which arise from fresh earth, have been supposed to destroy the miasmata, which produce malignant fevers, by entering into mixtures with them. Most of the men, who were employed in digging graves and cellars, and in removing the dirt from the streets in Philadelphia, in 1793, escaped the fever of that year." (Inquiry, &c.)

In those instances of exemption from malignant fevers, it is clear, that the volume of air received into the lungs, in respiration, was less pure than the common air of the atmosphere.

It is notwithstanding to be observed, that the danger of an attack of this fever is increased by the breathing of such impure air, for a short time *only*; after leaving an atmosphere in which the disease takes place.

I have known persons to fall victims to the yellow fever, who, after having left the harbour of Havana, had visited it again, from an adjoining village; where the houses are surrounded with trees, grasses, and aromatic plants. On the other hand, many have likewise been seized with this fever, after leaving West-India ports for the sea; having been exposed to the gases of decomposed water, in the former situations, and suddenly changing them for the more common air of the latter.

I think it important for all persons from the north, in any of the tropical ports, to quit their vessels as speedily as they can; and to remain on the land, without visiting the harbour unnecessarily, till they are ready to depart from the climate. But it is safest, for such as have their duty requiring them to be much on board, never to visit the shore, when it can be avoided. For changes of situation, either from the water to the land, or from the land to the water, are attended with danger.

For security against the pernicious effects of sudden exposure to local differences in the air, it is advisable in sea-ports, &c., that all the wastes of animal and vegetable substances, and all foul collections of water, which may be found about the houses and grounds, or on board of vessels in the harbours, should be speedily removed; and that the dampness of dwelling-houses, in low situations,

and of vessels lying in ports, should be corrected by the burning of coals. Also, in all cities and towns, it would tend to lessen the general danger of the prevalence of the yellow fever, and, perhaps, of other inflammatory diseases, if trees were planted wherever room would admit them; and if as much of the grounds, as could be spared for the purpose, were kept covered with spreading vines and other leafy plants.

A difference is found, however, in the effects of plants on the air. The willow, for instance, absorbs great quantities of hydrogen, and, we may suppose, that most succulent plants absorb abundance of both oxygen and hydrogen. The plantain and banana trees are thought to meliorate unwholesome situations in the West-Indies.

Lord Bacon accounts thyme, marjorum, and the like sweet-scented vegetables, to be conducive to health, in a barren soil.

Dr. Goldsmith, in his History of the Earth and Animated Nature, mentions a remarkable circumstance from Boyle, which is applicable to what has been said above. "In the island of Tarnate, belonging to the Dutch, a place that had been long celebrated for its beauty and healthfulness, the clove trees grew in such plenty that they, in some measure, lessened their own value; for this reason the Dutch resolved to cut down the forests, and

thus to raise the price of the commodity; but they had soon reason to repent of their avarice; for such a change ensued, by cutting down the trees, that the whole island, from being healthy and delightful, having lost its charming shades, became extremely sickly, and has continued so to this day."

In conclusion, on the subject of prevention, I would recall the attention of such as are within the limits of this disease, to their guarding against the circumstances which can aid its remote causes. These are, in general terms, the sudden transition from cold to heat, from abstemiousness to excess, from indolence to fatigue, from gaseous mixtures of the air to a purer atmosphere; and from either of these conditions to its opposite. But these observances are not to be anxiously attended to; for "we ought by no means," Hippocrates tells us, "to accustom ourselves to too nice and exact a method of living; because those who have once begun to act by this rule, if they vary in the least from it, find themselves very ill; which does not happen to those who take a little more liberty, and live a little more irregularly."

Should any other than the most obvious of the foregoing precautions, for preventing the disease, be made use of, nothing short of the treatment

which is requisite for its removal after the moment of its having taken place, can suffice; the only means of security against its danger, whether actually present, or barely threatened, being to reduce the constitution to such a state, as shall render it unsusceptible of the morbid influences of its exciting causes, and their effects.

CURE.

In fever with indirect debility, while the vascular system remains loaded with fluids, the power of muscular contraction is, in a measure, lost; but if the vessels be relieved of their burthensome fulness, they contract and recover in some degree their lost powers. The depletion, therefore, which is practisedf or lowering the constitution, may, within due bounds be also employed for increasing the strength.

1. Accordingly, the first general indication for the cure of this disease, will be to remove plethora and all morbid retentions from the system; whereby we may be assisted in what we are to regard as our ultimate indication: viz.

2. To re-establish in the organs of the body generally, their lost tone and action.

The first indication is to be answered by bleeding, or purging, or both; and by promoting the excretions in the extreme vessels, by the use of aperient drinks and medicines.

The second indication requires for its accomplishment, the exciting of the capillary, or glandular vessels, by the employment of external emollient and stimulating applications, and medicines

that are moderately tonic, together with light nutriments; and, should these prove insufficient, recourse must be had to the more powerful tonic astringents, and antiseptics.

1st. In respect to bleeding, when this operation is judged necessary, as a remedy, it is the first to be put in practice. The British navy physicians, with whom I have met in the West-Indies, are in the habit of using this method of depletion, to the extent of thirty ounces of blood, at first; and if the symptoms are unusually severe, or time has been lost in the beginning, they bleed, to the extent of forty, fifty, sixty, or even more ounces. The bleeding is repeated by them, once in six or eight hours, while the pains continue severe, and the heat and soreness of the stomach, have not been much alleviated.

Although this practice may sometimes be necessary, it can suit only such persons as, by good living and a regular life, may be supposed to have an abundance of spare materials accumulated.

All those, on the contrary, who eat and sleep irregularly, and drink much spiritous liquor, are affected with orgasm, when taken with this fever; so as only to show symptoms resembling that condition of plethora, and hard pulse, which usually require to be reduced by the losing of blood. For the latter description of persons, much bleeding

would prove pernicious; because by it, the countervailing power of life, to support itself under the effects of this disease, would be too much diminished.

For such also as are of a broken constitution, the loss of a considerable quantity of blood might prove injurious, on the same account.

The fat of habit, likewise, have been found but illy to support bleeding, on account of the comparatively small proportion of blood, in such subjects.

The effects of bleeding are known to be influenced by the state of the atmosphere; when the weather is hot and dry, bleeding more seldom proves hurtful than in sultry and moist times.

As in pleurisy, when expectoration has taken place, bleeding is not practised, because of its tendency to suppress the more favourable discharge from the part which is the immediate seat of the disease; so in this fever, for the same reason, bleeding should not be employed, when the abdominal secretions and excretions are freely performed.

Copious bleeding, in the subjects requiring the loss of blood, and such especially are all those who are attacked suddenly with comatose symptoms, whether their pulse be full and throbbing, or suffocated, may always be performed at one operation,

and by a large orifice; that the unmanageable fulness of the vessels may be taken away at once; but if the pulse and spirits are much depressed, it will be better to use a small bleeding, and repeat it four, five, or six times, on the first day, to avoid the too hasty reduction of the stimulus of distension in the heart, which organ is already somewhat depleted, by the unequal distribution of the blood. In cases of this latter kind, it is sometimes found necessary to take away blood, not only on the first and second days, but later in the disease.

In some chronic cases of a secondary fever, I have taken away a few ounces of blood, after the twentieth day of the disease; which seemed to put a stop to its career.

Bleeding, by the application of leeches to the temples, and near to other pained parts, gives great relief in most cases, and sometimes precludes the necessity of general bleeding.

This disease has many of its symptoms seated about the abdominal viscera. Bile is not regularly discharged into the duodenum; even if much of it be formed, it is for the most part locked up in the hepatic system. The mesenteric and cæliac arteries and veins are also turgid with blood, which has been crowded into them. Purging, therefore, after bleeding, or more particularly

when bleeding has not been thought requisite, immediately on the attack of the disease, is always to be employed. It proves useful, not only for evacuating the retained excrementitious, and other offending matters, from the first passages; but also, by favouring all the intestinal functions, the diseased fulness of the blood vessels of those parts is taken off. Repeated purging, therefore, is to be considered as a very essential part of the cure.

In the yellow fever of 1793, in Philadelphia, Dr. Rush fixed on the practice of giving "strong purges of calomel and jalap, or of calomel and gamboge, every day, while the fever continued." Ten grains of the submuriate of quicksilver, and fifteen of jalap, were prescribed by him for a dose, to be given every day; or, in the place of it, he gave, every six hours, two and a half grains of the submuriate of quicksilver, with the same quantity of gamboge. "The purges," he says, "seldom answered the intention for which they were given, unless they produced four or five stools a day. As the fever showed no regard to day or night, in the hours of its exacerbations, it became necessary to observe the same disregard to time, in the exhibition of purges. I therefore prescribed them in the evening, at all times, when the patient had passed a day without two or three plentiful stools. When purges were rejected, or slow in their ope-

ration, I always directed operating clysters to be given every two hours." (Account of the Bilious Fever of 1793.)

After the mercurial purges had sufficiently opened the more distant excretions, he gave more lenient ones, as castor oil, salts, cremor tartar, and rhubarb.

In the year 1797, large doses of the submuriate of quicksilver were administered alone; and afterwards a purging was kept up by lenient articles, amongst which daily use was made of small doses of soluble tartar. Much of the credit of establishing the use of the foregoing successful remedies, for combating the dangerous fevers of the United States, Dr. Rush declares to be due from the public, to several other physicians, the names of some of whom he has mentioned.

The use of emetics is generally considered to be inadmissible in this disease, on account of their tendency to increase the irritability of the stomach. But after plentiful doses of purgative medicines have been administered, if a frequent retching of phlegm and bile continue, indicating foul substances still to remain adhering to the upper intestines, I frequently give ten grains of ipecacuanha, with one grain of the tartarized antimony, to be repeated within half an hour, if necessary, to re-

move them; which accords also with the practice of Dr. Rush.

After a thorough cleansing of the bowels has been effected, some practitioners have depended mostly on exciting a salivation, as a further means of effecting the cure of this disease; and, with this intention, they have employed the submuriate of quicksilver, and friction with quicksilver ointment. Under this treatment, the patients who are easily salivated, for the most part, recover. But, in many cases, the noxious powers of the disease produce their worst effects, quicker than a salivation can be excited. Of this description of cases, are those in which the subjects feel an intense burning in the stomach, have a watery diarrhœa, without fœces, are found with a small hard pulse, and are excessively weak. Such symptoms show the stomach and bowels to be inflamed.

Dr. Cullen's instructions for treating cases of gastritis, should be most strictly attended to, when the symptoms just mentioned are evident. I shall transcribe it from his most valuable work, as being the only safe course to be pursued; and, for this reason, not likely to be too often repeated.

(393.) "It is only in the cases of phlegmonic inflammation, that we can advise the cure, or resolution, to be attempted by large and repeated bleedings, employed early in the disease; and we

are not to be deterred from these by the smallness of the pulse; for, after the bleeding, it commonly becomes fuller and softer. After bleeding, a blister ought to be applied to the region of the stomach, and the cure will be assisted by fomentations of the whole abdomen, as well as by frequent emollient and laxative clysters."

(394.) "In this disease the irritability of the stomach will not admit of any internal medicines being thrown into it; and if any internal medicines can be supposed necessary, they must be exhibited in clysters. The giving of drinks may be tried, but it ought to be of the very mildest kind, and in very small quantities at a time.

(395.) "Opiates, in whatever manner exhibited, are very hurtful, during the first days of the disease; but when its violence shall have abated, and when the violence of the pain and vomiting recur, at intervals only, opiates given in clysters may be cautiously tried, and sometimes have been given with advantage."

(403.) "When an erythematic inflammation of the stomach has arisen from internal causes, if pain and pyrexia accompany the disease, some bleeding, in persons not otherwise weakened, may be employed; but as the affection often arises in putrid diseases, and in convalescents from fever, so in these cases bleeding is inadmissible; all that

can be done being to avoid irritation, and to throw into the stomach what quantity of acid and of acescent aliments it shall be found to bear. In some conditions of the body, in which this disease arises, the Peruvian bark and bitters may seem to be indicated; but an erythematic state of the stomach does not commonly allow of them."

After following these instructions of Dr. Cullen, when the symptoms have required such a course, our second indication may be entered upon; but in cases not exhibiting those symptoms, having cleared the intestinal tube, by purging with the submuriate of quicksilver and jalap, or gamboge, and clysters, I still pursue the first indication, and give, every four or six hours, until a copious sweating, or an incipient ptyalism, shall have been produced, a dose, composed of three grains of calomel, and the same quantity of the compound powder of ipecacuanha; or, if much nausea be occasioned by the use of this dose, I substitute six grains of the nitrate of potassæ for the compound powder of ipecacuanha, to be given with the calomel. When these means answer their intention, the disease terminates. But if, in a short time, a ptyalism be not excited, I desist from the further employment of calomel, and make use of lenient purgatives and clysters, from time to time, to keep

the stomach and bowels free, and remove congestions.

Rice, or barley water, having a little gum-arabic dissolved in it, is the only drink and nourishment necessary, during the foregoing treatment; and to these may be afterwards added, during the continuance of much fever, some other diaphoretic and diuretic medicines; as the spirit of nitrous æther, the water of acetite of ammonia, &c. &c.

2d. Then, in pursuance of the second indication of cure, we have to re-establish, in the enfeebled system, its appropriate tone and functions. For this purpose, if vomiting should harass the patient, as it must now be owing to previous exhaustion of the stomach, this organ particularly must be invigorated.

Dr. Darwin affirms, that a blister on the back has the effect of relieving sickness, indigestion, and heart-burn; and adds, as a reason of it, that the action of the stomach is increased by direct sympathy with that of the skin, and the tendency to vomit, which was owing to its diminished action, ceases.

Besides blistering, other external applications have been found serviceable, for assisting the internal means made use of, to raise and support a diaphoresis, and, by that means, to mitigate nausea and vomiting; as flannel wrung from hot vine-

gar, and sprinkled with camphorated spirits; or warm emollient cataplasms to be applied over the stomach, and more extensively over the body.

I have found good effects from such-like fomentations, and other external emollients and stimulants.

In order to soften the skin, that the circulations may be carried on in the cutaneous vessels, if this has not, by any of the foregoing methods, been established, let frictions with olive oil, and afterwards tepid effusions, or fomentations, be used.

The very judicious observations of Dr. James Currie, on the use of water in the treatment of fevers generally, will serve as a safe and useful guide in the treatment of this. And I copy from his valuable work the following observations, as particularly applicable to my present purpose: "While the heat is great, the skin dry, and the vascular system strong, I use water perfectly cold: when these symptoms diminish, I use it cool; and as they subside further, I make it tepid. Again, in fevers accompanied by, or originating in, high local inflammation, which are generally known by a great disposition to chilliness, I do not depend on, or recommend affusions cold or tepid. Yet cold water may be used, as a drink in fevers, at any time, when there is no sense of chilliness present, when the heat of the surface is steadily above

what is natural, and when there is no general or profuse sensible perspiration." In fever, attended with dysenteric symptoms, as is sometimes the case in this, Dr. Currie's experience, in accordance with my own, forbids cold to be applied in any form; as likewise while there is any foul matter remaining in the bowels.

The persons, for whom I have found affusions of water to be particularly beneficial, have been those of the weakly or nervous description. In such I have feared to administer evacuating medicines, or the sub-muriate of quicksilver, to the extent which the mastering of the disease in them seemed to require.

When the action of the bowels, by its excess, may be supposed to cause nausea, cold water clysters, or weak opiate clysters, have produced the happiest effects.

The treatment, thus far, to prove successful, must have been put in practice, step by step, before the state of the body shall have become generally asthenic.

Furthermore, to prevent a torpid, and a consequent gangrenous condition of the system, the whole of the first passages must be kept gently excited, and the fluids in them corrected. Consequently the diet, which, on account of the patient's loathing of food, as well as the improprie-

ty of his taking any other, has hitherto been of the lightest fluid kinds, such as gruel made of rice, barley, or sago, must now be changed for something a little more nutritious, especially if craved.

He may eat his rice, sago, &c., with a sauce made of wine, water, and sugar. When the stomach bears these well, the patient may be gratified in his appetite for eating other articles of food, and drinking wine and water, cider and water, small beer, or porter, &c. Yet very great caution is all along to be observed, not to overburthen the stomach. It proves very beneficial, at this period of the disease, if the patient experience some interesting thought, a gratification from the taste of his food, or drink; or from a change of air, by a desired removal from one place to another; or if he enjoy a cleanlier bed, or cleanlier clothing than usual.

To aid these means for promoting the due actions of the system, it is prudent, before the pulse be too low, to make use of a weak watery or vinous infusion of the Peruvian bark, the Angustura bark, or some other bitter and astringent medicine, acidulating the infusion moderately with the muriatic acid. But, should these increase the heat, or produce oppression of the stomach, water of acetite of ammonia, or lemon, or orange juice, may be substituted for the mineral acid. If morbid acidity in

the stomach be a cause of nausea and uneasiness, ten grains of the potassæ subcarbonas, may be given, with the bitter infusion, as a corrective.

When the due actions cannot, by any of these means, be readily restored to the system, or when gangrenous symptoms approach, the bark in substance, camphor, wine, or other antiseptic, tonic, and cordial articles must be industriously employed; with precautions, at all times, as to the manner of exhibiting them, to prevent inflammation, or any distress to the patient.

For assisting internal tonics, external applications should still be employed; as compresses dipped in a warm decoction of chamomile flowers, cascarilla bark, Peruvian bark, or the like tonic and bitter articles, with a mixture in them of a quarter part of camphorated spirits, or of brandy. These should be laid upon the belly, the temples, the stomach, &c.; and the extremities, and the back, which are commonly the seats of much pain and uneasiness, should be fomented, and rubbed with stimulating embrocations. Blisters or sinapisms must be used, when other stimuli are found ineffectual.

When medical aid has been neglected in this disease, until the system has fallen into a state of general debility, the burthensome fulness of the vessels must nevertheless be taken off. But as

bleeding, in this condition of the body, may not be thought admissible, purging and the discharges by the skin and kidneys, can only be had recourse to. The purging, in these cases, should be effected by cordial means; as by giving, first, a moderate dose of the submuriate of quicksilver, and soon after it a mixture of a scruple or half a dram of rhubarb, in powder, with half an ounce of the London tincture of tamarinds and senna. This dose, if it does not prove sufficiently operative, should be repeated, or a clyster or two administered, to produce full purging. But these, if too often employed, prove dangerously debilitating. Nor under like circumstances, can either an attempt to produce a ptyalism be made, or cold bathing be used. Amongst the cases that have been neglected, or not well treated in the beginning, are seen those, for the most part, in which an erythematic inflammation of the stomach arises, and which require the treatment above transcribed from Dr. Cullen's practice. (403.)

To promote the cutaneous and urinary secretions, under general weakness, emollient and stimulating applications, such as have been already mentioned, should be applied to the surface of the body; and tepid, acid, and aromatic drinks, with the addition to them of some diaphoretic and diuretic medicine, but not antimony, should be taken

internally; as every third or fourth hour a cup of the effervescing draught, or of lemonade, with a dram of spirit of mint, and half a dram of spirit of nitrous æther, or from two to four drams of the water of acetite of ammonia, and half an ounce of the camphorated mixture, in a cup of barley water.

The distressing violence of the vomiting, is sometimes so unmanageable, that the sufferer, for the fear he has of provoking it, is unwilling to trust to the taking of any thing, whether drink or medicine.

Some West-India practitioners are said to have stopped the actual black vomit, with pills of capsicum, three grains each, made up in dough, so as to prevent a burning effect on the throat, when taken: one of these is given every three or four hours.

Agreeably to the practice of Dr. Rush, in such cases, I have afforded great relief to patients with this symptom, by administering equal parts of milk and lime-water. Dr. Dorsey cured a patient of the black vomit, by means of administering large quantities of brandy and volatile alkali; and Dr. Physick stopped it, by giving ten drops of the spirit of turpentine in a little molasses, or syrup, or sweet oil. I stopped it in a young man, who had been well purged, but not bled, yet had lost a considerable quantity of blood, by a frequent hæmorrhage of the nose, by giving him colombo root,

and Russian castor, in doses of a scruple of the former, and ten grains of the latter; with ten drops of the muriatic acid, in a draught of mint water, repeated every 4th hour. And I have known several to recover after vomiting black, by being left to take only the drinks they desired, without any medicine.

When the symptom of hiccough is added to the vomiting, I give every fourth hour, or oftener, from a scruple to a dram of the compound spirit of sulphuric æther, or a tea spoon full of a mixture of equal parts of the sulphuric æther, and tincture of opium, either in the common drink, or in whatever potion of other medicine, I may be administering at the time. An epithem, with the confection of opium, is useful, in such cases, to be spread upon linen, and applied warm to the region of the stomach: viz.

℞ Confect. opiat. ʒiv.
Spirit. camphorat. ʒx.
m. Acet. distillat. ℥ii.

Opium may also be given internally, to procure sleep, when any symptoms of convulsions take place.

Small doses of the volatile tincture of valerian, with an equal quantity of the tincture of castor, conjoined occasionally with the camphorated mixture, or infusion of cascarilla, has been re-

commended to be given, two or three times a day, for strengthening the constitution; and particularly the nervous system. I have given the same medicine, with much advantage, to persons recovering from their struggle with this malady.

A treatment somewhat different from the foregoing, will be requisite in fevers of a mixed nature. If the disease partake of the marsh fever, and the *synocha*, it will require an earlier and more free use of the Peruvian bark, than can be employed in the genuine yellow fever. When symptoms of the jail fever, or common typhus, are concomitant with those of the *synocha*, more opium, wine, cold affusions, or bathings, and cold drinks, must be had recourse to; and in both these species of mixed fever, much less depletion, whether by bleeding or purging, will be indicated; whereas the use of emetics will be more required.

Lastly, it is obvious, that persons of a scorbutic habit, with fever, cannot well bear either bleeding, salivating, or blistering. For such, where the yellow fever is seen, I have succeeded best by administering abundance of vegetable acid drink; clysters; and a purge or two of the compound powder of jalap; and afterwards, without loss of time, an infusion of bark, or some other tonic medicine, combined with water of acetite of ammonia and camphor.

EXTRACT OF A LETTER

FROM

CYRUS PERKINS, M. D.

CITY OF NEW-YORK.

MY DEAR SIR,

* * * * You perceive, by the publications of this country, that the old controversy on the question whether the *yellow fever* be a contagious disease or not, is still kept alive amongst us. And, though some of the old disputants have left the stage, and others seem to have lost much of their interest in the discussion, we have, now and then, an accession of fresh hands, who seize on it with as high a relish as though the question were a new one. For my own part, though I early made up an opinion on the subject, I never had so chivalrous a disposition as to enter the lists for making proselytes. And, I have often thought, that, if the disputants, by way of preliminary, were first to agree on a precise definition of terms, they would find but little left to dispute about.

Is it not remarkable, that the word *contagion*, a word of so frequent use, in professional writings, and in books of science, should never have acquired a definite or precise meaning; that, instead of being stamped with technical precision, as its importance demands, it should so long have been suffered to pass, as a fluctuating and uncertain currency of common language?

From their indiscriminate use, the words *contagion* and *infection*, *contagious* and *infectious*, as applied to diseases, would seem to be synonymous or convertible terms; yet no respectable philologist, I think, will admit that they really are so. It is true, we cannot resort to etymology, in all instances, for the best authorized acceptance of words; because long use, or, perhaps it may be said, abuse, often renders that arbitrary. The particular use of words and terms, acquire, in this way, a sort of secondary, and, indeed, an absolute legitimacy. But where this has not been fully attained; where words continue to be used in different senses, by different writers, and even by the same writers, at different times, it would seem desirable to limit their technical use, to accord, as nearly as possible, with their radical meaning. But to give technical precision to a term, it will often be found necesary to restrain its meaning, within limits, somewhat arbitrary. Thus, the word

contagion, in an unlimited sense, might mean whatever, by coming in contact with the body, is capable of producing disease. And as there are probably few diseases which are not produced, either directly or indirectly, by some noxious principle, foreign to the body itself, and applied either to its external or internal surfaces, it would follow that, in this loose sense, a large proportion of our diseases might be said to be contagious. A somewhat similar remark would apply to the word *infection*. Without technical limitation, it would, perhaps, be nearly synonymous with *contagion*; except that the former would convey the idea of a poison mingled with, or attached to, or imbuing some other body. And as *contagion* must be supposed to be generally communicated, through the medium of some body which, in common language, is said to be infected with it, (for a body, in this sense, as well as the atmosphere, may be infected with contagion,) it is not difficult to see the origin of the loose and indiscriminate employment of the terms, *infectious* and *contagious* diseases.

But, it appears to me, and I think it corresponds, in general, with the usage of the most correct modern writers, that, to give precision to medical language, the word *contagion* should be applied to such poisons only, as originate in a diseased animal secretion; and are capable of reproducing themselves by exciting, in a sound body, the

same specific action, in which themselves originated; such poisons as were, originally by Mr. Hunter, and subsequently by Dr. Adams, denominated *morbid poisons*. A *contagious* disease, then, would be such only, as is produced by exposure to those morbid emanations, which are generated by a specific vascular action, in one labouring under a like disease.

On the other hand, the term *infection* should be applied, I think, to such poisons as are produced by the changes taking place about inanimate matter, either animal or vegetable, during their decomposition. And the circumstances, which seem most to favour this process, are heat, moisture, and confinement; though the latter may have no further influence than to give effective intensity to the poison. *Infection*, then, differs from *contagion*, in this, that although the former may occasionally arise from animal secretions, such as the matter of sensible, or even insensible perspiration, or from the accumulated filth of numerous individuals, crowded into small and uncleanly apartments, yet there is not, as in the production of contagion, necessarily a morbid vascular action. *Infection* may be constituted by deleterious miasms or poisonous emanations, from the surface of the earth, in certain situations; or it may arise from foul matter, at various depths beneath the surface, decomposing un-

der the influence of long continued and intense heat; and thus, more or less extensively, impregnate or infect the atmosphere. So, it may sometimes be generated locally, as even in an empty hold of a ship, or about the persons and beds of the sick on shore, or in filthy apartments occupied by the sick; yet healthy individuals, from abroad, who sicken by being exposed to such infection, do not necessarily sicken of the same disease as that about which it originated. And of the individuals exposed to it, probably but an inconsiderable proportion will suffer from its influence; the relative number depending on the condition of body, and other circumstances, in which the persons exposed may happen to be, at the time. The same individual, therefore, will contract an infectious disease, by an exposure at one time, which at another, precisely similar in all circumstances external to himself, he had escaped with impunity. Not so with *contagion*, its source is uniform and certain; of whatever kind it is, its origin is invariably a specific morbid secretion; and of those coming within its active sphere, rarely one escapes its specific effect; this too, scarcely influenced by circumstances of health, habit of body, temperature, or climate. It may be remarked, further, that in comparing infectious diseases, all of which are acute in their nature, with that class of contagious,

which are also acute, the former appear at irregular and uncertain periods, after exposure to their cause ; whereas the latter are, in this respect, uniform and certain.

I have said, that healthy individuals, who sicken by being exposed to infection, originating about those labouring under disease, do not *necessarily* sicken of the same disease as that about which the infection arose. In making this remark, I was not unmindful of a question, which was naturally enough suggested, and indeed, which has been urged, with a good deal of earnestness. Those who, in certain instances, discountenance the idea of contagion, are called on to show, Why it happens, that an individual, exposed to the effluvia or surrounding atmosphere of persons ill of certain diseases, sickens of the same disease as that to which he has been exposed, rather than another, unless, during their progress, there be generated a specific virus : or, in other words, unless they be strictly contagious diseases ? Why A. for instance, visiting the ill ventilated apartment of B. lying sick of *yellow fever*, should contract that particular form of disease, rather than a *typhus*, or a *dysentery*, unless *yellow fever* be propagated by contagion ? It is possible, that to meet this demand may be a difficult task, and that I am under an erroneous impression, in supposing

it otherwise; but should you think proper, in the course of your remarks, to go at all into the consideration of this subject, I am persuaded you will find it fully within your power to give a satisfactory explanation of all such facts; and to show that they afford little aid to the opinion of those, who insist that *yellow fever* is a contagious disease. We know from medical records, as well as from unfailing experience, that seasons have their reigning diseases. The sway of a particular disease is sometimes absolute, and has the extent of an empire; again, it is modified, and confines itself within the limits of its petty sovereignty; and it may even be circumscribed within a small section of a city.

The cause, we conclude, must be coextensive with the prevalence of the disease; but what its precise nature may be, in each instance, or how it, singly or combined, determines, as it evidently does, the particular type and form of the disease of that season, we do not know; and shall perhaps never be able to ascertain.

We do indeed know, in general terms, that certain miasms from stagnant waters and marshy situations, mixing with, and thus infecting the atmosphere of their neighbourhood, produce intermittent and remittent fevers. But apparently,

the same cause, and in the same situations, in other seasons, produces epidemic dysentery.

Last season, *typhus fever*, within certain geographical boundaries, was the reigning disease; but in an adjoining district it was *dysentery;* and in another direction, it was *typhoid pneumonia*. This season, where the last named disease prevailed, it is an unusually healthful district; and *typhus fever* and *dysentery*, in the others, have exchanged locations. The next season, in all these places, the voice of health and gladness is every where heard; the scourge falls on others, and more remote.

In these different situations, I think it is well supposed that certain causes existing in and producing a local infection of the atmosphere, predispose those who reside within their domain, to diseases of a particular and uniform type. But how such causes, apparently continuing the same, are varied to effect an entire change of diseases, in a succession of seasons, and still preserve to each its precise and determinate character, is a question which, at present, admits of no rational solution. These predisposing causes, thus existing, determine the character of all infectious diseases; and on the circumstance of their sphere of influence being confined to a point, or within narrow limits,

or widely extended, depends their being sporadic, endemic, or epidemic.

The exciting causes of such diseases, which are extremely various, appear to have no agency in fixing their type; whereas, in a contagious disease, it is the exciting cause alone, the contagion, and not the predisposing, which stamps its character. Thus, in the late case of Mr. K—, the great fatigue he endured, and exposure to the intense heat of the sun, in an open boat, in our harbour, previous to his attack, might have produced a fever of an ordinary type, had he not, by lately breathing an infected air at Philadelphia, been already predisposed to *yellow fever*.

It is certain, that whatever diminishes the vital energy, or produces irregularity or imperfection, in the discharge of functions essential to health, may prove the exciting cause of a reigning disease, whatever it may be. The same exciting causes, therefore, which in one district produce *dysentery*, in another produce *typhus*, or *intermittent*, or *yellow fever*. A., residing where *typhus fever* is the reigning disease, is in a state of health not to be materially interrupted by the general, predisposing cause, without the aid of something which shall operate as an exciting one. He is suddenly called, without having been exposed to any one sick of *typhus fever*, to visit B., at a distance, dangerously ill of

dysentery; and where a mortal *dysentery* is prevailing. Confining himself now about his friend, deprived of his usual exercise, breathing the unwholesome air of ill ventilated apartments; enfeebled, too, by watching, and strong apprehensions of danger, he soon falls sick—not of *dysentery*, but of *typhus fever*. He is now removed, and placed in an apartment where C. lies ill of *cholera morbus*, and D. of a *broken limb*. E. and F., friends of C., frequent this apartment, in discharge of the common obligations of humanity. They have, for some time, respired the atmosphere of the vicinity, but have not been exposed to any one sick of the reigning disease. Within the four first days, however, they both sicken with *dysentery*, and discontinue their visits. On the following day, both C. and D. fall sick in like manner. Hence it appears, that exposure to the effluvia and circumstances about the apartment of B., sick of *dysentery*, proved the exciting cause of *typhus fever* in A., who, coming out of a typhus atmosphere, was predisposed to that form of disease. While E. and F., predisposed to *dysentery*, became its victims, by frequenting the unwholesome apartment occupied by A. with *typhus fever*, C. with *cholera morbus*, and D. with a *broken limb*.

Now, if instead of being ill of *dysentery*, B. had been sick of *typhus fever*, when visited by A.; and

C. and D., when visited by E. and F. had been ill of *dysentery*, in place of *cholera morbus* and a *broken limb*, the result of the exciting cause would have been the same ; and it would have been adduced in evidence, that a specific virus was generated in the cases of B. C. and D. ; and that A. E. and F. contracted their several diseases from the *contagion* of *typhus fever* and *dysentery*.

Of those who sicken of a *typhus fever*, or a *dysentery*, or a *yellow fever*, during the prevalence of either of them, there will be found many who have never approached any one labouring under the reigning disease ; it is, therefore, not to be presumed that all who happen to fall sick, after visiting the abodes of such disease, become so from exposure to the persons of the sick, or to the noxious effluvia of their apartments, even as *exciting* causes ; for other exciting causes, such as great irregularities and intemperate indulgencies, act no less powerfully, in multiplying the disease, than exposure to the foulest apartments of the sick.

Thus, where yellow fever is prevailing, A. attends the sick and dying with impunity ; while B. cautiously avoids every exposure to them. Afterwards, companions in a fit of intoxication and debauch, they both sicken and die of black vomit.

I think no man of experience, in our profession, will deny, that, what I have stated, is in accord-

ance with facts; and, imperfectly as I have explained my ideas, you will gather from them grounds, on which I would explain, Why healthy individuals, visiting those sick of *dysentery*, or *typhus fever*, or *yellow fever*, contract a like disease, rather than another, supposing them, at the same time, not to generate a specific virus; or, in other words, not to be contagious diseases.

With much regard and esteem,

Yours, &c.

CYRUS PERKINS.